

ABSTRACT OF THE DISCLOSURE

An optical latch based on a lasing semiconductor optical amplifier is disclosed. The optical latch is configured to achieve one or more stable states in response to the input of predetermined signals at a “SET” input and a “RESET” input of the optical latch. The optical latch includes first and second LSOAs, each of which is configured to receive a pump input and generate an amplifier output. Each LSOA is also associated with a respective combiner and splitter. The combiner associated with each LSOA combines an input signal from the “SET” or “RESET” input, as applicable, with a signal received from the splitter of the other LSOA and the resulting combined signal is then input to the LSOA. Each splitter receives a ballast laser output from the associated LSOA, which is then split into two signals, namely, an input to the combiner of the other LSOA and an output signal.

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